

Notice of Allowability

Application No.

10/648,469

Examiner

Stanley J. Pruchnic, Jr.

Applicant(s)

IGNATOWICZ, STEVEN

Art Unit

2859

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☐ This communication is responsive to _____.
2. ☒ The allowed claim(s) is/are 1-13 and 23-36.
3. ☐ The drawings filed on _____ are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☒ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☒ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date 20040909(atch).
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 3/2/04
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-13 and 23-36, drawn to determining the rotational position of a vehicle, classified in class 374, subclass 45.
 - II. Claims 14-16 and 37-39, drawn to replacing distorted pixels from the captured image with non-distorted pixels, classified in class 348, subclass 442.
 - III. Claims 17-22 and 40-46, drawn to calculating a normalized hotspot temperature, classified in class 374, subclass 102.

The inventions are distinct, each from the other because of the following reasons:

Inventions I, II and III are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention I has separate utility such as for determining the rotational position of a vehicle not requiring replacing distorted pixels from the captured image or calculating a normalized hotspot temperature as required by the respective limitations of inventions II and III. Invention II has separate utility such as for replacing distorted pixels from the captured image not requiring determining the rotational position of a vehicle or calculating a normalized hotspot temperature as required by the respective limitations of inventions I and III. Invention III has separate utility such as for calculating a normalized hotspot temperature not requiring determining the rotational position of a vehicle or replacing distorted pixels from the captured image as required by the respective limitations of inventions I and II. See MPEP § 806.05(d).

2. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.
4. During a telephone conversation with MATTHIAS ABRELL on 10 September 2004 a provisional election was made with traverse to prosecute the invention of GROUP I, consisting of Claims 1-13 and 23-36. Claims 14-22 and 37-46 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

EXAMINER'S AMENDMENT

5. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.
6. Authorization for this examiner's amendment was given in a telephone interview with MATTHIAS ABRELL on 17 September 2004.
7. The application has been amended as follows in order to clearly describe the invention:

In the Specification:

8. On Page 18, in Line 11, after "Fig." the number "12" has been deleted and replaced therefor by --18-- in order to more clearly describe the invention by correcting a minor typographical error.

9. The title of the invention has been changed to **--METHOD AND SYSTEM FOR DETERMINING THE ROTATIONAL POSITION OF A MOLTEN METAL VEHICLE--** in order to be more indicative of the invention to which the claims are directed.

In the Claims:

10. Claims 14-22 and 37-46 have been **canceled** without prejudice.

11. Claims 1 and 23 have been amended as follows:

CLAIM 1 (presently amended). A method of [[sensing the temperature]] **determining the rotational position** of a molten metal vehicle, comprising:

dispensing molten metal from the molten metal vehicle;

capturing at least one thermal image of the **molten metal and of the** molten metal vehicle;

identifying an area of the dispensing molten metal from the thermal image; and

determining the rotational position of the molten metal vehicle based on the identified area.

CLAIM 23 (presently amended). A system for [[sensing a temperature]] **determining the rotational position** of a molten metal vehicle, comprising:

at least one thermal imager **for providing thermal image data of a dispensing molten metal and of the molten metal vehicle**; and

a controller communicably coupled to the thermal imager, wherein the controller is adapted to receive **the** thermal image data from the thermal imager, identify an area of dispensing molten metal from the thermal image **data**, and determine the rotational position of the molten metal vehicle based on the identified area.

Allowable Subject Matter

12. The following is an examiner's statement of reasons for allowance: The articles by Botelho *et al.*, and Sahr disclose thermal imaging of a molten metal vehicle including many related elements of the claimed invention, but lack a disclosure or suggestion for capturing a thermal image while the molten metal vehicle is in a rotated (pouring) position. The prior art of record fails to show or suggest a method or apparatus wherein determining the rotational position of a molten metal vehicle includes capturing at least one thermal image of a dispensing molten metal and of the molten metal vehicle and determining the rotational position of the molten metal vehicle based on an identified area of the dispensing molten metal. Because none of the prior art teaches or suggests this element, this feature, taken together with the other limitations of the claims renders the claims allowable over the prior art.

13. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Drawings

14. The following changes to the drawings have been approved by the examiner and agreed upon by applicant: Figure 6 show(s) modified forms of construction in the same view, i.e., the orifice 34 is shown in the "upward position" but also in the "pouring position" since the same element is shown on the bottom, shown pouring molten metal). Applicant has agreed to amend the Fig. 6 by deleting the orifice and molten metal stream shown on the bottom of the torpedo car. In order to avoid abandonment of the application, applicant must make these above agreed upon drawing changes.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art cited in the form PTO-892 and not mentioned above disclose related thermal measurement and/or imaging devices and methods.

- US 5968227 A (Goldstein, Daniel A. et al.) and US 4222506 A (Sakashita et al.) disclose thermal imagers used for capturing images of a molten tap stream, identifying an area of dispensing molten metal, but do not suggest using the image data for determining a rotational position of the ladle or converter.
- US 5331311 A (Doctor, Alan P.) discloses sensing position of a vehicle using a thermal sensor.
- US 5185667 A (Zimmermann, Steven D.) discloses methods and apparatus for correcting image distortion using algorithms or look up tables.
- US 4768158 A (Osanai, Takahito) and US 4343182 A (Pompei, Francesco) disclose related uses of thermal imagers.
- US 4733079 A (Adams, Mark J. et al.) discloses identifying marks using a thermal imager.
- US 4524954 A (Baas et al.) and US 4367865 A (Blair et al.) disclose related molten metal vehicles that rotate to dispense molten metal.
- US 3101618 A (HANCE RICHARD J) discloses thermal scanning of a rotary kiln shell.
- The articles by Peacock, Kauppinen *et al.* and Cramer *et al.* disclose methods using thermal imaging and related apparatus for molten metal systems.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stanley J. Pruchnic, Jr., whose telephone number is **(571) 272-2248**. The examiner can normally be reached on weekdays (Monday through Friday) from 7:30 AM to 4:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego F. F. Gutierrez can be reached at **(571) 272-2245**.

The **Official FAX** number for Technology Center 2800 is **(703) 872-9306** for **all official communications**.

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Any inquiry of a general nature or relating to the status of this application or proceeding may be directed to the official USPTO website at <http://www.uspto.gov/> or you may call the **USPTO Call Center** at **800-786-9199** or 703-308-4357. The Technology Center 2800 Customer Service FAX phone number is (703) 872-9317.

The cited U.S. patents and patent application publications are available for download via the Office's PAIR. As an alternate source, all U.S. patents and patent application publications are available on the USPTO web site (www.uspto.gov), from the Office of Public Records and from commercial sources.


Private PAIR provides external customers Internet-based access to patent application status and history information as well as the ability to view the scanned images of each customer's own application file folder(s).

For inquiries relating to Patent e-business products and service applications, you may call the **Patent Electronic Business Center (EBC)** at **703-305-3028** or toll free at **866-217-9197** between the hours of **6 a.m. and midnight Monday through Friday EST**, or by e-mail at: ebc@uspto.gov. Additional information is available on the Patent EBC Web site at: <http://www.uspto.gov/ebc/index.html>.



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9/17/04

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